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ABSTRACT

This guide was the product of a national conference and regional seminars, and is intended to help state and local administrators, curriculum specialists, supervisors, and teachers in establishing and operating programs of curriculum development for programs of vocational and technical education. The guidelines, representing broad approaches to the many problems of curriculum development, are to be used as a basis for reflective thinking. Included are: (1) Concepts and Assumptions, (2) Curriculum Development, Dissemination, and Coordination, (3) Standards for Curriculum Development, (4) Special Sources of Curriculum Materials, (5) Evaluation of Curriculum and Curriculum Materials, (6) Professional Development of Personnel in Curriculum Activities, and (7) National Implications. A bibliography, a list of governmental agencies with potential resources for vocational and technical education, and supported steps in curriculum development, modification and improvement are appended. (GR)

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# A GUIDE FOR THE DEVELOPMENT OF CURRICULUM

# in

# Vocational and Technical Education

DIVISION OF VOCATIONAL EDUCATION
UNIVERSITY OF CALIFORNIA
LOS ANGELES, CALIFORNIA
JUNE, 1969

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Division of Vocational Education
University of California
Los Angeles, California
June, 1969

This publication was prepared pursuant to a grant with the Office of Education, U. S. Department of Health, Education and Welfare. Points of view or opinions were developed at a National Conference in Dallas and nine Regional Clinics. They do not, therefore, necessarily represent official Office of Education position or policy.

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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1969

## FOREWORD

The 1968 amendments to the Vocational Education Act of 1963 indicate that the Congress recognized the imperative role of curriculum development in an expanding program of vocational education. This role is complicated by a variety of geographical, educational, and procedural factors. Because progress in vocational education is directly related to curriculum development, the Congress authorized the Commissioner of Education to investigate thoroughly a number of key elements related to curriculum development. Accordingly, the Commissioner of Education, as a part of a total study of the 1968 Amendments, authorized a National Conference for the study of Curriculum Development in Vocational and Technical Education.

The Division of Vocational Education, University of California, Los Angeles, California, planned and conducted the National Conference which was held in Dallas, Texas, March 5-7, 1969. Representatives of the Division of Vocational and Technical Education, Bureau of Adult, Vocational, and Library Programs, Office of Education, assisted generously with planning, evaluation, and review of data from the National Conference. Results of the National Conference were subjected to further discussion and review in nine Regional Clinics, which were held during March and April of 1969.

Participants at the National Conference represented a broad cross section of interests in the public and private sectors and included business, industry, and labor; State and local government; Chambers of Commerce; State and local school boards; the Armed Forces; private schools; vocational educators; commercial publishers; representatives of a number of levels of public education; and the public at large. From this broad background of interest and concern in curriculum development in vocational education, it was possible to construct a consensus representing National, State, and program needs. The opinions of the persons attending the National Conference were supplemented by the opinions of the persons attending the Regional Clinics. The report, therefore, is based upon the considered judgment of many people.

This report is intended to be a guide for all persons concerned with curriculum development in vocational and technical education. Direction indicators, in the form of recommendations, provide a basis upon which curriculum and curriculum materials may be developed, implemented, and evaluated.

The Directors of the National Conference on Curriculum Development were David Allen, Coordinator of Trade and Technical Teacher Education, California State Department of Education, and James R. D. Eddy, Dean Emeritus, Division of Extension, The University of Texas at Austin.

Melvin L. Barlow, Director
Division of Vocational Education
University of California

Professor of Education
University of California, Los Angeles

Los Angeles, California
June 1969

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# Chapter I

# INTRODUCTION

The major task confronting the Federal Board for Vocational Education in 1917 was the preparation of instructional material. Because curriculums for vocational-technical education did not exist, they had to be created, and there were few models to follow.

The objectives set for the curriculum in 1917 were reasonably clear: to prepare workers for entry into the labor force and to provide the employed worker with opportunities to increase his social, civic, and economic mobility. In other words, the end product was to be a productive worker. These basic curriculum objectives are valid in 1969, but complications have arisen because of the diverse nature of the groups to be served and because of the wide range of occupations included within the purview of vocational-technical education today.

The vocational-technical education curriculum has been responsive to social conditions such as World War I, the great depression of the 1930's, World War II, and the contemporary emphasis upon people who have not been well treated by society. It has also been sensitive to the general state of technology. The dynamism of social conditions and technology creates the necessity for attention to change in the vocational-technical education curriculum. When social and technical changes occur rapidly, as they currently are doing, changes in the curriculum for vocational and technical education are urgent and imperative.

## FROM 1917 TO THE AGE OF TECHNOLOGY

At first the major effort in the development of instructional material was undertaken by the Federal Board for Vocational Education. For several years the Board retained a large staff to produce the material representative of the vocational-technical content. Later, when the program grew substantially throughout the nation, this procedure was no longer practical. Teacher educators in vocational-technical education then focused upon "occupational analysis" as a means of helping teachers produce their own instructional material. Curriculum development, in its larger sense, did not exist. In the high school at least half of the day was devoted to general studies, and half was devoted to vocational-technical studies with no more than an accidental relationship between the two.

Teacher-prepared instructional materials, with each teacher responsible for his own materials, worked fine for many years. In some instances even today it is the only way to approach a particular problem. However, as enrollment in vocational-technical education expanded, total reliance upon teacher-prepared materials became a complicated matter. Teacher-education institutions began to stockpile good examples of curriculum materials, and new teachers spent their time updating such materials and adapting the materials to their programs of instruction. Exchange of materials from teacher to teacher, school to school, and State to State became common practice. Within a particular school the teacher was left to his own devices, except in larger districts where assistance was available from curriculum specialists.

Then came World War II, and everything changed. The dramatic instructional materials developed to prepare more than eight million people to work in defense production for the nation created new ideas and desires related to curriculum development. Immediately following World War II, special task forces prepared instructional materials for special areas. A number of States organized curriculum laboratories, and National conferences and workshops were conducted in recognition of the pressing need in the whole area of curriculum development, including a vast expansion in preparation of curriculum materials.

The need for curriculum development and instructional materials continued unabated. The Division of Vocational and Technical Education, United States Office of Education, made valiant attempts to solve some of the curriculum problems, and the publishers throughout the nation made evident their desire to participate in the production of materials. Innovative ideas from a variety of sources were put into practice. Nevertheless, the total effort in curriculum development and in preparation of instructional materials was merely a drop in the bucket.

## THE AGE OF VOCATIONAL EDUCATION

In 1961 President Kennedy appointed a Panel of Consultants on Vocational Education to study the total area of vocational education and to report its findings and recommendations. The Panel, in its report *Education for a Changing World of Work*, discussed in some detail the need for curriculum development, the problems involved in it, and the need for preparation of instructional materials. The Panel's recommendations were quite clear:

> It is recommended that the production of instructional materials for vocational courses be recognized as vital to an effective national program and that–
>
> 1. One or more instructional material laboratories be established to produce and distribute vocational instructional materials.
>    a. Programed learning aids, visual aids, and newer methods of the presentation and use of materials should be considered in the production of instructional materials.
>    b. All materials developed should be made available to private publishers for maximum distribution.
> 2. It be a responsibility of the U. S. Office of Education through the Division of Vocational and Technical Education to–
>    a. Establish and administer instructional materials laboratories through contractual arrangements with a State department of education, a college, a university, or a large school district.
>    b. Develop policies for the operation, coordination between centers, production of materials, and distribution of the materials produced in these centers.
>    c. Finance the operation of these centers.
> 3. An adequate quantity and an appropriate quality of instructional supplies, tools, instruments, and equipment be recognized as essential to good instruction. Standards of evaluation should consider the quantity and quality of supplies, tools, instruments, and equipment available.[1]

[1] U. S. Department of Health, Education and Welfare, Office of Education, *Education for a Changing World of Work* (Washington, U. S. Government Printing Office, 1963), pp. 240-241.

The intent of the Panel concerning instructional material development was included in the Vocational Education Act of 1963, but it was lost in a listing of other imperatives. The Act did not emphasize the need for the development of curriculum and instructional materials to an extent commensurate with the Panel's expectations. Despite later exemplary efforts of the Division of Vocational and Technical Education, Office of Education, and similar efforts of the States, the actual progress in curriculum development fell far short of expectations and needs.

Five years later, in 1967, the matter of curriculum development came to the attention of the Advisory Council on Vocational Education. The Council supported the Panel's earlier views concerning curriculum and in the general report of the Council, *Vocational Education: The Bridge Between Man and His Work,* the following recommendation was made:

> *IT IS RECOMMENDED, That there be established two to four centers for curriculum development in vocational education.*
>
> At present, some 12 curriculum centers are operated by the States, usually in cooperation with universities. Each of these centers has developed curriculum materials for the occupations most commonly taught in vocational education. Very little time or money has been spent on each of these, the result being that we have many poor sets of materials for teaching the more common occupations. For the less frequently taught occupations, little or no curriculum materials are available. There is need for two or three well-developed sets of curriculum materials for each of the occupational fields. This would give each school a choice, and it would still prevent waste and unnecessary duplication.
>
> Probably 10 times as much money has been spent on curriculum materials for physics (taken by 5 percent of the high school students) as has been spent on the 100 or more occupations commonly taught in vocational education.[2]

The Council's report also provided Congress with guidelines for preparing the Vocational Education Act of 1968. This Act, however, made a special issue of curriculum development in vocational and technical education. Part I of the Act clearly delineates the intent of the Congress and expresses in general terms the intent of the Advisory Council on Vocational Education. The substance of this part of the act is embodied in the following paraphrased statements:

1. Curriculum development is important.
2. The task of developing curriculum for vocational education is complicated in a variety of ways.
3. The purpose of Part I is to provide the ways and means of achieving the desired program of curriculum development.
4. Ten million dollars is authorized for Fiscal Year 1970.
5. The Commissioner of Education has a number of choices to make in order to implement this section; he can:
   a. Make grants to colleges or universities.

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[2] U. S. Department of Health, Education and Welfare, Office of Education, *Vocational Education: The Bridge Between Man and His Work* (Washington, U. S. Government Printing Office, 1968), p. 209.

b. Make grants to State Boards.
c. Make grants to other public or non-profit private agencies and institutions.
d. Make contracts with public or private agencies, organizations, or institutions.

6. The objectives are as follows:
   a. To develop and disseminate vocational education curriculum materials.
   b. To develop standards for curriculum development.
   c. To coordinate efforts of states and prepare lists of available material.
   d. To survey curriculum materials of other governmental agencies.
   e. To evaluate curriculum materials and their use.
   f. To train personnel in curriculum development.

The total program of curriculum development is complicated by a number of factors such as the varying ability of States to provide appropriate curriculum materials, the obvious possibility of duplicated effort among the States, the large number of occupational areas involved, the curriculum needs of special groups of people, the necessity to update curriculum materials which are currently available, and the preparation of curriculum specialists in vocational education. Despite previous efforts to solve some of these problems, much needs to be done in developing standards and in utilizing the curriculum experience, materials, and processes common to the private sector of the economy. It will not be possible for vocational education to exert its entire efforts toward the solution of some of the contemporary social and economic problems of the nation until more effective procedures are provided to improve, develop, disseminate, and use curriculum materials. With the many complicated factors affecting curriculum development, it is essential to realize that the problems cannot be solved by a single approach.

## STRUCTURE OF CONFERENCE

A National Conference on Curriculum Development in Vocational and Technical Education was held in Dallas, Texas, on March 5, 6, and 7, 1969, with more than 240 participants from some forty States, the District of Columbia, and the Virgin Islands. The conference was sponsored and supported by a grant from the United States Office of Education, Bureau of Adult, Vocational and Library Programs, Division of Vocational and Technical Education, to the University of California at Los Angeles. The conference was initiated by Melvin Barlow and planned with the help of David Allen, as conference director, both from the University of California at Los Angeles, and James Eddy, co-director, from The University of Texas at Austin.

The conference addressed itself to the following areas:

- The production and dissemination of curriculum materials.
- The development of standards for the maintenance of curriculum effort.
- The preparation of plans for the coordination of National, State, local, and private sector efforts in curriculum development and production.
- The identification and utilization of the curriculum materials of other government agencies and the private sector.

- The development of criteria for the evaluation and utilization of curriculum materials.
- The preparation of professional personnel in curriculum development.

In conjunction with these objectives, five major papers were presented:

- "Current Trends in Curriculum Theory and Development" by Louise L. Tyler;
- "Development, Dissemination, and Coordination of Curriculum" by Gerald R. Leighbody;
- "Evaluation of Curriculum Materials and Their Use" by James Popham;
- "The Development of Standards for Curriculum Materials" by Byrl Shoemaker; and
- "Training of Personnel in Curriculum Development" by Alberta Hill.

The National Conference was structured to provide for small group discussions immediately following each of the five major papers that had implications for vocational and technical education. In addition, a panel discussed the curriculum efforts of other agencies. The panel discussion group consisted of John P. Walsh, moderator, who reported on governmental agencies; Clifford Welch, who reported on the Armed Forces; Francis L. Goff, who reported on business and industry; and Lawrence Walsh, who reported on private sector publishers. A summary of the National Conference was presented at each of the nine Regional Clinics, which in turn held small group discussions. Materials from the reports of both the National and regional meetings have been used as the basis for this document.

## PURPOSE OF THIS PUBLICATION

This publication has been prepared for use by administrators, curriculum specialists, supervisors, and teachers at the State and local levels in establishing and operating programs of curriculum development which are essential to the success of their programs of vocational and technical education. The guidelines represent broad approaches to the many problems of curriculum development since each State and local agency must modify and adapt them to its particular situation. They should serve as "direction indicators" with special notations as to key aspects and problems encountered in the work of curriculum development. The statements contained herein should be used as a basis for reflective thinking and in no case accepted as mandatory.

## Chapter II

## CONCEPTS AND ASSUMPTIONS

Throughout the National Conference on Curriculum Development the speakers made certain assumptions and set forth concepts which must be understood for a thorough comprehension of their remarks. This *Guide for the Development of Curriculum in Vocational and Technical Education* utilizes the following basic statements in making the contents of subsequent sections more meaningful:

*Curriculum* is defined in terms of the sum of the experiences that a student has under the guidance of the school. A curriculum may contain outlines (that stress or assume the validity of a fixed group of graded and required facts, skills, and activities), curriculum resources, or curriculum guides.

A major purpose of education is to prepare people to adjust to and improve the present and future society. Vocational education must be considered a part of the total education of an individual because success in a particular vocational area is dependent upon general education as well as vocational education. This implies that vocational education must concern itself with the teaching of basic general knowledge and skills as well as vocational knowledge and skills.

The technological age of today is increasing the demands for all types of vocational-technical education, both for those about to enter employment and those already on the job. Emphasis is also being placed on the development of acceptable behavioral characteristics in all youth. Vocational-technical education can assist in the development of these desirable attitudes, work habits, and personal characteristics that are necessary to live and participate successfully in this society. Curriculum planned on the pre-employment level can never assume the role of education for a lifetime. Education, general and vocational, must be continuous throughout one's life.

A basic right in this country is the individual's privilege of choosing his own occupation. An economic society and the opportunity to participate in its cultural values are dependent upon the satisfactory employment of its members. To facilitate this outcome, social demands and legislative directives have required a commitment of vocational education to planning programs for *all* kinds of people, in *all* kinds of communities, and for *all* kinds of occupations. The charge given to vocational-technical education requires (1) an extensive corps of highly competent curriculum specialists to work continually for the improvement and modification of existing curriculums and to create instructional programs for new occupations and (2) a coordinated program of in-service training to assist teachers in the effective use, evaluation, and further improvement of curriculum materials.

Curriculum development in vocational-technical education is complicated by the diversity of occupational objectives; differences in educational levels, types of programs, and groups served; geographical variations in occupations; and by a wide range of occupations.

Although there are basic principles of curriculum development, competent subject matter specialists are essential when these principles are applied to specific occupations.

Vocational-technical education, while not unique as a discipline, is unique as a program, and this uniqueness is reflected in student goals, curriculum, instructor qualifications, and facilities and equipment needed for the instructional program.

Statements concerning education and curriculum that deserve attention:

- The school's basic function is to facilitate maturity.
- Every individual is worthy of education's thoughts, concerns, and endeavors.
- Little is known, with certainty, about either curriculum theory or curriculum development.
- The ends and means of vocational education have not yet been blueprinted.

  All of us have the attitude that "we are masters of our fate" and that we can change the world.

Vocational-technical education must continue to be an integral part of the total program of education. It must work much closer with general educators in the development of a "Career Planning Program" that will assist youth in this very important activity. Career planning should extend from the elementary level through the post-secondary schools. Vocational-technical educators must also work much more closely with business and industry so as to bring into being better training objectives that meet the true needs for successful employment. Each of the following chapters begins with the recommendations for implementation, as developed by the National Conference and the Regional Clinics, followed by a summary of the presentations and discussions.

## Chapter III

## CURRICULUM DEVELOPMENT, DISSEMINATION, AND COORDINATION

### *RECOMMENDATIONS*

- *Vocational-technical education curriculums should be an integral part of the total school program.*
- *Realistic preparation for the world of work must be accepted as a basic responsibility of public education.*
- *Cooperative planning should be implemented between general and vocational educators to:*
  - *Examine the total needs of students;*
  - *Provide for coordination of vocational-technical and general educational programs;*
  - *Provide for team planning of curriculum and teaching;*
  - *Provide for the establishment of behavioral objectives for the total educational program; and*
  - *Insure maximum involvement of administrators.*
- *Teachers must be involved in planning for curriculum development to the maximum extent possible.*
- *Curriculums must be concerned with the learning ability, social and economic needs, and maturity of the student as well as the specific training demands of the occupation.*
- *Objectives should be specific in terms of performance goals, and criteria should be prepared for evaluating behavioral characteristics.*
- *Curriculums should permit instruction utilizing a variety of teacher modes applicable to the individual learning needs of the student and should provide for a maximum of generalization and transfer.*
- *Evaluation must become a continuous part of the maintenance and improvement of the curriculum.*
- *Development of vocational-technical curriculum must begin with an analysis of the employment requirements and demands.*
- *Vocational-technical curriculums must be oriented to the individual needs of the varied groups it will serve and must provide for entry into or advancement in different levels of employment.*
- *States should provide or arrange for in-service teacher-education programs in the effective use of curriculum materials and in the use of the multi-media approach for meeting the needs of diverse groups of students.*

- *The Office of Education should assume leadership in developing long-range plans for establishing regional and State centers of curriculum development that produce curriculum materials meeting high standards of quality and effectiveness.*

- *Plans should be developed for the dissemination of information about curriculum materials at the National, regional, and State levels. (Plans must provide for the distribution of curriculum materials to teachers and others that are not available through normal channels.)*

- *Plans must be formulated for the development of acceptable outlines and formats; a bank of behavioral objectives must be established; efforts must be coordinated; plans for dissemination of information and distribution of curriculum materials should be developed through a series of National conferences of curriculum specialists from the various States.*

- *The Office of Education should establish specific plans for the overall coordination of the development of curriculum materials. (There must be complete cooperation at the State and local levels to make this effective.)*

## INTRODUCTION

A well-planned curriculum, incorporating the multi-media approach for the use of instructional material, will enable the vocational-technical teacher to provide the kind of learning experiences and opportunities for the student to achieve the educational objectives most effectively and efficiently. The curriculum serves as the teacher's road map. It charts the paths of learning that lead to attainment of the desired objectives with a minimum of digression.

The curriculum, no matter how well-planned, will have educational value only to the extent that it is used properly. Hence, curriculum development must always be accompanied by an in-service teacher-education program. A continuing in-service teacher-education program will enable teachers to keep abreast of the changes in instructional content and media. Teachers are generally not curriculum specialists and need assistance in developing their own curriculum materials; however, they must be experts in the use of these materials.

A considerable amount of curriculum material exists about which most teachers have little or no knowledge. Such materials have been prepared by States and local areas with no provisions for making it available nationally. The problem involved in having materials reproduced and speedily made available to *all* vocational-technical teachers focuses attention upon the imperative need for a National dissemination program.

The job of curriculum development, a tremendous task that will never be completed, requires a well-planned system of coordinated efforts. A plan of coordination, to be effective, must be administered nationally.

Regional, State, and in some instances local curriculum development centers must be operated to meet the expanding demands for material. Centers cannot function without competent staffs of professionally trained curriculum specialists and must also have adequate supportive personnel, such as clerks, secretaries, editors, layout specialists, and illustrators. Physical facilities, equipment, and a good library are necessary. The cost of establishing and operating centers will be a limiting factor, and a center should not be established unless it can meet reasonable standards that will permit effective production of curriculum materials.

## CURRICULUM DEVELOPMENT

The curriculum is the sum total of the learning experiences for which the school has responsibility. To plan a curriculum means to select, arrange, and sequence these experiences, through the joint decisions of teachers and learners, so that successful learning results. In vocational-technical education, as in other areas, this requires that learning outcomes be clearly defined, in behavioral terms, and suitable evaluative devices designed to measure their achievement. Vocational educators will find this increasingly difficult to do because vocational success in our society is so dependent upon general educational development that the skills of work often cannot be identified from other life skills. A mere laundry list of operations and related technical information that was once considered the standard content for vocational courses is now quite inadequate.

Vocational-technical curriculum planners, like others, must start with basic educational decisions which lead to sound educational policies. These decisions must take into account at least four major determinants: (1) the nature and needs of our society, (2) the nature and needs of the learner, (3) the nature of the learning process, and (4) the nature and role of the teacher.

To serve all who need preparation for work, vocational-technical educators will need to form educational partnerships with business, industry, and government so that more students can receive on-the-job training while they are still in school. The curriculum should be developed to encompass cooperative education programs.

Certain generalized competencies that in the past have not been the responsibility of vocational-technical education have now become so because they are necessary to hold and perform a job. Among these are functional competence in reading, in written and oral expression, and in the use of the basic mathematical and scientific processes. The skill of weighing evidence and forming judgments is required in many occupations; others emphasize social and human relations skills. Many occupations emphasize a combination of all these skills in varying degrees. Therefore, vocational-technical educators must share fully in the development of these skills, and curriculum developers must include them in their planning.

Career orientation and career planning are part of vocational education. The Federal Vocational Education Acts of 1946, 1963, and 1968 have provided funds and authority for

vocational-technical educators to enter actively into the area of career orientation, but they have never done so. Now those in the area of vocational-technical curriculum development must make it a matter of first priority.

## INVOLVEMENT OF TEACHERS

Curriculum cannot be separated from instruction or from teachers. It has long been customary for vocational-technical teachers to be active in curriculum development, often because they were the only "real experts" in their subjects. More recently, teachers have taken a renewed interest in curriculum decision making, and their active participation is now frequently sought when teacher organizations negotiate privileges and benefits with school authorities. Vocational-technical curriculum development must involve teachers at every stage. Curriculum decisions made by so-called experts and passed along to teachers have seldom found their way into classroom action. The only curriculum a teacher is likely to take seriously is one he has helped to plan. Vocational-technical curriculum improvement, therefore, must be closely coordinated with teacher education and calls for greater involvement of teachers in the development, utilization, and evaluation of curriculum materials. In the future, if vocational teachers are to contribute as they should to curriculum improvement, they must participate, on a continuing basis, in curriculum development.

## INVOLVEMENT OF OTHERS

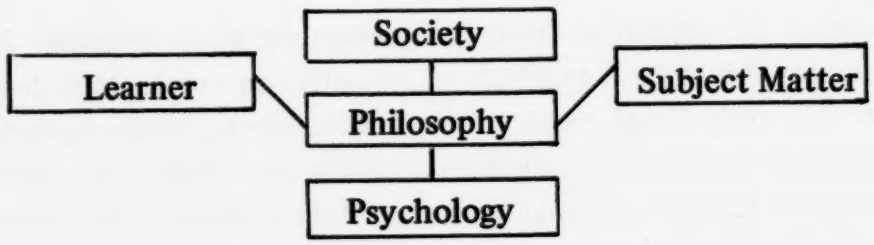
The curriculum for today's world of work usually requires an interdisciplinary approach involving teachers of related basic subjects, researchers, and specialists from the field of work. A team approach is often necessary in curriculum development. In many instances representatives of trade or professional groups should be involved from the beginning, and the content should always be validated by advisory groups.

## CURRICULUM OBJECTIVES

In developing curriculum objectives it is essential that the values of society and the subject matter content be used as a base for the formulating process. The objectives must be related to the educational level and learning needs of the student. Standards for the attainment of learning must provide for the difference between the student's current level of attainment and the intended level of attainment so that an acceptable norm can be identified when it is achieved. The level of learning attainment eventually achieved by a student is directly related to how well the student's learning level was originally identified and how realistic the instructional objectives were for the particular student.

Three sources of input must be employed in overall curriculum development. These sources relate to the learner, the values of the society in which he lives, and the subject matter demands of the occupation for which he is preparing. These three elements are processed through two screens, philosophy and psychology. The educational philosophy is utilized in order to eliminate inconsistencies and inconsequentialities and to demonstrate

relationships to societal values. Psychology is utilized to determine feasibility, compatibility, and the specificity of the instructional objectives to the goals of the instructional program within the complexities of the world of work and the surrounding society. A diagram of the major factors in curriculum development is shown below:




Thus, curriculum development involves the intermeshing of a number of factors that assist in directing students toward realistic goals both in terms of terminal instructional performances and the accumulation of significant characteristics for daily life.

Within the context of the educational goals which are set by the school and designed to be achieved through learning experiences within the curriculum, there must also be instructional objectives that suggest the methods and content of instruction and the standards by which the instruction will be evaluated. The development of these instructional objectives must take into consideration the level of instruction, the kinds of students to be served, and the employment skill demands of the occupation for which training is being provided. The sequencing of instruction and the selection of instructional techniques and media become vehicles by which the teacher and the student interrelate so that each student is provided with appropriate learning activities to fulfill his needs.

By comparing each student with the standards of performance stated in the instructional objectives, it is possible not only to evaluate his achievement but also the original objectives. Thus objectives may be modified and/or instructional methodology and media can be adapted to provide instruction more applicable to the varying needs of the students.

## DISSEMINATION OF CURRICULUM MATERIALS

There is a wealth of curriculum material in existence about which most vocational-technical teachers have little or no knowledge. This makes the problem of the dissemination of information about curriculum material as important as that of the actual development. Immediate steps should be taken to collect, classify, and evaluate all curriculum materials pertinent to vocational-technical education and to disseminate this information to teachers. The accomplishment of this large task may require contractual agreements with several regional or State agencies. Until these steps are taken, it will be impossible to determine the current status of vocational-technical education and identify the weak areas.

A plan for dissemination of information about available curriculum materials must include some type of acceptable evaluation of the material itself. After a procedure is

adopted, the evaluation could be accomplished through contracts with various educational agencies. The procedure must assure uniformity of evaluation data. Upon completion of evaluation, material having the greatest value for local teachers should be made available to them. To insure this availability may require a central or regional center for reproduction of curriculum material not available from the original source.

Information about curriculum material must be put into the hands of the local teacher as soon as possible. The information should clearly indicate (1) the major objectives, (2) for whom it is intended and at what levels, (3) how it is to be used, (4) possible supplementary resource materials, (5) who developed it, and (6) procedures and standards for evaluation.

Curriculum development is of such importance that each State should establish an office with a full-time staff of one or more curriculum specialists and the necessary supportive personnel. All information and distribution of material should be channeled through that State office to the local level. It is equally important to reverse the process to transmit information from the local level through the State office to the National level when appropriate.

## COORDINATION

Nationwide coordination of curriculum effort is an absolute necessity. Fragmented efforts resulting in "plowing the same ground" are both economically inefficient and ineffective in assisting vocational-technical education. A well-conceived and properly administered plan for coordination of effort by one central agency at the National level is necessary for a curriculum development program of the magnitude now envisioned and required for success.

The plan at the operational level in curriculum centers must provide for personnel having comprehensive knowledge of curriculum development and who in addition have competency in specialized subject content areas related to the different instructional levels.

Some curriculum material will always be unique to certain areas or communities, but without complete coordination the degree of uniqueness remains unknown. The mobility of business and industry is such that a business creating a unique condition in one area may expand it into other areas on short notice and thus create the same need again. Coordination is necessary to insure maximum effectiveness in the use of curriculum materials for diverse groups such as the handicapped and disadvantaged, as well as those from the rural, urban, and ghetto areas. Hence the plan for curriculum development must contain a leadership nucleus at the National level so that maximum direction and effort can be emphasized and maintained.

## Chapter IV

## STANDARDS FOR CURRICULUM DEVELOPMENT

### *RECOMMENDATIONS*

- *Standards should be formulated immediately for the development of curriculums, broad in scope and covering basic factors, so as to permit a maximum of flexibility in meeting geographical, occupational, and technical variations throughout the fifty States.*

- *Development of curriculums must be based upon occupational analyses and on preparation for entry into the labor market and/or successful advancement in employment on a career-ladder basis.*

- *Curriculums must be oriented to the individual needs of the diverse groups they will serve and must provide for entry into employment at different occupational levels.*

- *Advisory groups must be involved in the planning of curriculums and in validating content material.*

- *Curriculums must provide for the social and economic needs of the students as well as the necessary skills and related knowledge.*

- *Subject content in curriculums must be determined by the demands of the occupation for which the training is provided and must be appropriate to the learner's abilities and needs.*

- *Curriculums should include information as to requirements for physical facilities, equipment, and instructional aids.*

The task of developing curriculum materials is so great that it will take the efforts of all vocational-technical educators working together to meet the more important needs of our ever changing, technological society. For efficient and effective cooperation among all areas of the nation, there must be established some broad standards to which a majority of professional curriculum personnel agree. These standards will substantially assist in producing curriculum materials that not only *can* but *will* be used everywhere in this nation. The development of such standards should be one of the immediate goals of the Office of Education.

The occupational goal of the student should become the center of the instructional program, and the experiences and knowledge necessary to prepare for this goal should become the basis for the curriculum. The curriculum must not be separated from the supportive services including enrichment education, social services, economic support, physical and mental health, and remedial education. The curriculum for vocational-technical education must be organized around the following premises:

- It prepares for initial job entry and continuing successful employment as a responsibility of public education.

- It is goal-centered and related to employment.
- It is relevant to the social and economic conditions of our society and to the maturity of the student.
- It provides for successful participation in our society as a citizen.
- It provides for the basic general education that is necessary for successful employment and required by the diverse groups of students being served.

To prepare a youth for entry into an occupation, the requirements for a successful worker in that occupation must be identified. The first step in the process of curriculum development is an occupational analysis to determine the knowledge required of a successful worker, the abilities he must possess, and the behavioral characteristics he must display. A broad pattern for analyzing an occupation where appropriate should include a review of the following major items:

- Occupational practices and skills
- Related science, mathematics, and psychology
- Appropriate equipment, tools, instruments, and materials
- Safe practices and work precautions
- Occupational terminology
- Relevant specifications, charts, tables, graphs, and drawings
- Suitable work habits and attitudes
- Interpersonal relationships
- Physical capabilities

The second step in the process of curriculum development is to organize a course outline which sets forth the title, objectives, and the knowledge, skills, and work habits to be covered by the course. This information is derived from the occupational analysis. The course outline also will suggest prerequisites for entry, level of teaching, and length of time required by the course.

The third step is to develop a course of study from the course outline. It should include:

- A concise statement of purpose of course
- The main divisions with a suggested time limit for each
- A statement of objectives for specific areas of instruction
- A suggested procedure for teaching
- A detailed outline of related information
- The media to be used with particular reference to student motivation
- Activities designed to foster the development of desirable attitudes and work habits
- Procedures for evaluating the progress of students

The development of acceptable curriculum materials should include the following factors:

- Evidence of a reasonable basis for authority
- Assurance of technical accuracy
- Criteria for the adequacy of content or scope
- Provision for adjustment to the educational level of the student
- Organization which provides simple learning units
- Organization for individual and group use
- Provision for individual student response
- Procedures for checking student progress
- Design to insure attractive appearance
- Procedures for overall evaluation of end results
- Organization around the student's goal
- Preparation on an experience-oriented basis
- Assurance of psychological soundness

Curriculum development begins with an occupation's need for a worker and ends with the placement on the job of a student who meets the need satisfactorily.

## Chapter V

## SPECIAL SOURCES OF CURRICULUM MATERIALS

### *RECOMMENDATIONS*

- *Collect, classify, and evaluate curriculum materials from all sources through a National clearinghouse.*
- *Provide comprehensive information to* all *States concerning curriculum materials available for use in vocational-technical education from special sources.*
- *Make available curriculum materials which are not obtainable by the public schools through normal channels.*
- *Maintain a program of constant review, updating information on curriculum material at least every two years.*
- *Make a study of the ways of cooperating, on the National level, with governmental agencies in the use of the data bank with electronic retrieval system.*

A wealth of instructional material, curriculum guides, and instructional aids are available through Federal agencies, including the Armed Forces, and National professional and trade groups. Much can be learned from the intensive efforts of the Armed Forces in developing instructional units and instructional materials, and they are willing to share these developments with vocational-technical educators. A concerted effort is needed to devise a strategy for the development of interagency coordination and a clearinghouse to make these materials known and available to vocational-technical educators. Knowledge of such material avoids wasteful duplication of effort. To the degree that vocational-technical educators avail themselves of the products of the efforts of others, they will have available more productive time to develop a wider range of materials to meet the needs of society.

The need for rapid retrieval of data by the business-industry community has led to applications of technology in the multi-media area that should be carefully studied by vocational-technical educators as a means of providing the best of current information and instructional materials to assist in the learning process.

Most governmental departments and independent agencies, on the Federal level, either through preparation of materials for in-service staff training or through the development of curriculum materials for their constituencies, have some active or potential inputs that can be utilized by vocational-technical educators. The range of curriculum materials includes course guides, instructional units, instructional aids, audiovisual materials, and information units. A list of potential governmental sources is included in the appendix.

National labor groups have formulated a considerable amount of curriculum material particularly in the field of apprentice training. This material has real value in the

development of vocational-technical programs for apprentices and journeymen. It involves a wealth of curriculum material organized on an individual study basis.

National, professional, and trade associations have developed curriculum material particularly adapted to the specific needs of certain groups. Much of this material should be carefully evaluated for use in pre-employment, part-time, and extension training programs in special areas. These groups usually welcome cooperation with the public schools in the further development of vocational-technical training programs.

A large amount of curriculum material of various types is known to be available. When it is collected, classified, and evaluated, the problem will be to give the vocational-technical teachers rapid access to this information. Business and industry have developed data banks with electronic procedures for rapid retrieval. Study should be made of the possibilities of cooperation on the National level with other governmental agencies in establishing a system of this type.

## Chapter VI

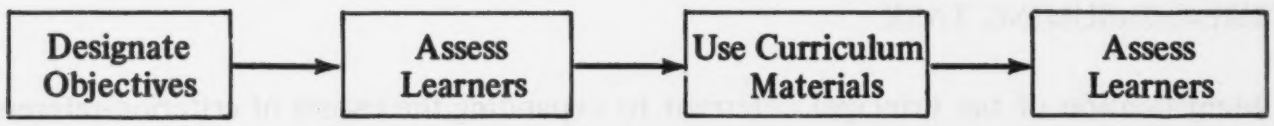
## EVALUATION OF CURRICULUM AND CURRICULUM MATERIALS

### *RECOMMENDATIONS*

- *The development of criteria to be used in evaluation of the attainment of specific performance objectives must be given careful attention.*
- *Evaluation should involve the classroom teacher, advisory groups, students, and employers.*
- *Evaluation must be carried on under a variety of actual learning conditions with each of the students.*
- *Evaluation should be an integral part of the instructional system, eventually broadening, achieving greater depth, and involving more persons and things so that it provides a basis for restructuring the curriculum.*
- *Evaluation should provide information on each student's development and should be so correlated that instructional emphasis can be adjusted to each student's needs.*
- *A system must be implemented whereby results of the evaluation of curriculum material by local teachers can be channeled back to the producers, so that the curriculum material can be realistically modified.*
- *Evaluation must incorporate student follow-ups.*
- *Evaluation results should provide both verbal and statistical information that evokes confidence in the findings.*
- *Evaluation of the curriculum and of curriculum material must be given wholehearted support by supervisors and administrators.*

### EVALUATION PROCEDURES

**The most defensible criterion by which to judge the adequacy of curriculum materials is the degree to which those materials, if used as directed, consistently bring about desired changes in the behavior of the intended learners. Schematically, this approach to the evaluation of curriculum materials can be represented as follows:**




**A Scheme for Evaluating Curriculum Materials**

The first step is either to construct or select a set of operationally stated instructional objectives that the curriculum may reasonably be expected to accomplish. Measures of student performance based on these objectives must also be prepared or selected. The second step is to assess the degree to which the learners can already perform the behaviors delineated in the objectives. This pretest is crucial to establish clearly that, prior to the interaction with the curriculum materials, the learners could not already display the intended behavior changes. The third step is to allow the learners to use the curriculum materials *as directed* by the developer of these materials. The manner of usage is becoming increasingly important, for if materials are to be used with immense variability, we should not be surprised if the results of their use are also tremendously variable. The final step involves posttesting learners to see whether the objectives have been achieved.

## EVALUATION BASED ON PUBLISHER DATA

Ideally, the publishers of curriculum materials should supply potential users with (1) sets of behaviorally stated objectives which their materials are designed to accomplish, (2) specific directions for use of the materials, and (3) validation data based on tryouts of the materials with learners whose characteristics are clearly explicated. Then the potential user could judge the similarity between his learners and those in the publisher's field tests and decide whether the probable success seems sufficient to warrant his acquisition of the materials.

## EVALUATION BY THE USER

For the time being the user will probably be the one called on to do most of the evaluation of curriculum materials. This will require the identification of specific objectives, suitable measures, and a thorough commitment to an ends-oriented or criterion-referenced approach to evaluation.

## CRITERION-REFERENCED INSTRUCTION

Criterion-referenced instruction focuses primarily on the degree to which the learner can perform specified criterion behaviors. For example, in reviewing the adequacy of instructional materials in meeting the established performance goals, the developers decide what to revise on the basis of learner performance data, not according to the judgment of consulting experts. A primary feature of criterion-referenced instruction is directly related to the results of instruction. This reflects an ends-oriented approach to instruction rather than a means-oriented approach.

## A TIME-CONSUMING TASK

Identification of the principal deterrent to expanding the extent of criterion-referenced approaches used in the nation's schools is fairly easy. Developing criterion measures of sufficient quality and satisfactory breadth entails too much work for most educators.

Developments regarding the use of behaviorally stated educational objectives may be instructive here.

It has become increasingly clear to those promoting the use of operationally stated objectives that they may be expecting too much to ask already harassed teachers and administrators to generate their own objectives. But though *objective generation* may be too demanding, *objective selection* should not be. If the instructor's task were simply to choose from comprehensive sets of operationally stated objectives those which he wished to achieve, his task would be manageable.

## LOCAL OPTION

Under any scheme in which the educator is the selector rather than the generator of objectives, there may be some concern regarding the degree to which the objectives will be "imposed from above." A viable scheme, however, should permit just that—the *selection* of objectives. Local autonomy in the selection of objectives should be an integral part of any objectives selection scheme. The availability of objectives from which to choose should increase the educator's range of alternatives but never decrease his self-direction.

A precise objective can be most helpful when planning an instructional sequence, since there is clarity regarding the anticipated post-instructional competencies of the learner. But an explicit objective becomes even more useful when an instructional sequence is being evaluated. This evaluation can be accomplished by ascertaining the degree to which the objective has been achieved. To perform the latter function, measuring devices based explicitly on the performance objective are needed. A criterion-referenced approach to instruction requires criterion measures.

A properly stated instructional objective must be student oriented, involve specified, measurable terminal behavior, and indicate the conditions under which behavior is to operate. The objective must also be specific and include measurement criterion against which success or failure can be judged. Occupational analysis should be used to insure specificity.

Educators can be encouraged to employ a criterion-referenced scheme in evaluating curriculum materials. The Office of Education should emphasize behavioral objectives for vocational-technical education in its cooperative efforts with State and local educational agencies. The Office of Education should also serve as a catalyst in gaining support for criterion-referenced objectives in evaluation by emphasizing whether the objective is being met, not whether it is relative. It will be necessary to use advisory committees, representative of business and industry, in evaluating criterion-referenced objectives. Teachers should be better prepared to develop specific objectives that relate to terminal behavior through more emphasis on this subject in both pre-service training and in-service workshops. If teachers are to be convinced that the criterion-referenced scheme is better for evaluation, administrators and supervisors must begin by emphasizing the outcomes of instructional evaluation rather than putting primary emphasis on the visible means of instruction.

Producers of curriculum materials can be encouraged to supply better data for evaluation purposes by using a systems approach in the entire area of curriculum development. With the acquisition of improved data, evaluations will provide information for the revision of methods, media, and objectives. Evaluation of this material, however, must be a two-way street, with the producers providing appropriate data for evaluation, and the users returning the results of the evaluation. There must be better training for vocational-technical teachers in evaluating on a result-oriented basis. Agreements with curriculum materials laboratories must contain provision for the development of data to be used for evaluation purposes. Teachers must provide information concerning the results of their evaluation to the producers in order to assist them in revising the data and material.

Follow-up programs on the results obtained from training can be used to provide feedback to curriculum producers. Teachers should conduct student evaluation and follow-up of students employed in the field. Feedback from students as well as follow-up records should be used in evaluation. Teachers, after evaluating curriculum material, should always review the objectives to determine if they are realistic.

The producers generally desire feedback to validate and improve their materials. However, teachers have expressed a concern that the producers may be willing to revise their materials very often because of cost factors. It is hoped that the profit motive will not be the only factor determining revision; ideally, improvement should be made when it is needed. Producers seem to realize that valid feedback comes from the classroom, and they are interested in the manner in which various classroom teachers utilize the materials. Occupational advisory groups assist the local instructor in evaluation curriculum materials under study and should be part of the system for feedback. The producer of curriculum materials should have the major responsibility for providing information for evaluation.

The effectiveness of curriculum material can best be judged by the student's preparation for work and by the employer's reaction to that preparation. Teachers should be required to go into the community where their students are working and find out what is happening. Teacher-education programs should emphasize methods of evaluation and methods of providing procedures with feedback.

## INSTRUCTIONAL OBJECTIVES EXCHANGE

If it were possible for school districts to have access to sets of objectives *plus test items* from which they could choose, they could select certain objectives and readily assess the degree to which their instructional approaches were successful. The existence of a pool of test items for each objective would really encourage educators throughout the nation to initiate criterion-referenced instructional strategies.

While the "Instructional Objectives Exchange" approach, if implemented in the fields of vocational and technical education, would facilitate more defensible evaluation of curriculum materials, there undoubtedly remains a prior consideration. The number of influential educators who support this approach to evaluation must first be expanded, for

**without vigorous advocacy of newer evaluation schemes, surely the old, inadequate approaches will prevail. For the sake of the thousands of students engaged in the study of vocational and technical education, superior methods of evaluating curricular materials must be adopted.**

## Chapter VII

# PROFESSIONAL DEVELOPMENT OF PERSONNEL IN CURRICULUM ACTIVITIES

### *RECOMMENDATIONS*

- *A long-range National plan for the training of curriculum specialists should be developed immediately.*
- *Provision should be made for internships in all ongoing curriculum development programs.*
- *National and/or regional seminars should be conducted for curriculum development interns.*
- *States should conduct a continuous program of in-service workshops for vocational-technical teachers that will be related to modification, adaptation, and effective use of curriculum material, including the use of new media that will better meet the needs of special groups of learners such as the disadvantaged or handicapped.*

The shortage of professionally competent curriculum personnel is a limiting factor in all curriculum activities. The problem of developing professional curriculum specialists cannot be solved by a few short courses, conferences, or seminars, but rather a long-range program of advanced study and internships will be needed to adequately cope with the massive shortage of personnel extant. By its very nature the solution will take considerable time to be truly effective. For this reason, immediate attention should be given to planning on a National basis for this type of program. College educators who are specialists in curriculum development and curriculum specialists from existing centers should be brought together to outline the type of program that will best serve the immediate needs for personnel.

Assisting vocational-technical teachers in the development of professional competency in the use of curriculum materials can and should be accomplished by all States through a comprehensive in-service training program. Teacher-education personnel and curriculum specialists working together can implement this proposal. Teacher educators should place more emphasis on the purpose of curriculum materials in their pre-service professional programs for beginning teachers. Attention should be given to the use of the multi-media approach in meeting the needs of special groups of learners such as the handicapped or disadvantaged.

Curriculum development requires multiple competencies, and quite often it is more efficient to use a team approach involving occupational analysis, teachers, scholars from supporting disciplines, administrators, and researchers working together. The curriculum specialists must:

- Have the ability to organize and coordinate the work of a team in a manner that will produce an effective curriculum.

- Have a knowledge of the various theories related to curriculum development, possess the ability to compare and analyze different theories, and be able to create adaptations for use in vocational-technical education.
- Have the capability for diagnosing the present and projected needs of the learner. (The diagnosis may entail occupational and job analysis; a complex extrapolation of economic trends; a survey of employment opportunities; or research designed to identify factors affecting the total development of the learner, including his ability to function effectively as a member of his family and community.)
- Have the ability to make competent judgments as to the validity and importance of content material. (In this area he must have the ability to use effectively representative advisory groups in determining the essentiality of content material and the validity of objectives.)
- Have a comprehensive understanding of the sociological and psychological principles of learning. (Of greater importance is the necessity for a thorough understanding of the application of these principles to the varied needs of a diverse learning group.)
- Have the ability to develop objectives in behavioral terms. (To be effective, the curriculum specialist must interpret performance goals in ways that communicate the intent of the program to all concerned.)
- Have the capability to organize content and learning processes into sequential activities that facilitate the achievement of the objectives.
- Have the ability to develop procedures for measuring the learner's progress and for providing the learner with feedback.
- Have the ability to translate objectives and instructional procedures into plans for materials and facilities.
- Have the ability to design and conduct research programs which will assist in testing and evaluating the materials in terms of the end results.
- Have the acumen and be acquainted with the dynamics of social-political action in order to implement curriculum change and thereby overcome inertia or resistance to change.

The need for highly trained curriculum personnel is so critical that emphasis must be given to preparing leaders from among educators who have potential but lack the necessary background. Experience in other fields lends support to the use of intern programs in which the potential leader actually performs as a curriculum specialist, making decisions which can be evaluated with the help of a clinical advisor. Internships of several months or a year, patterned after the internships of the National Association of Secondary Principals, would increase the output of present leaders as well as train additional personnel. Interns might conceivably work under the direction of persons such as occupational supervisors in the State departments of education, teacher educators in colleges and universities, or curriculum directors in vocational-technical schools. Interns might also serve as assistants to educational consultants or editors in publishing or educational media companies.

Short, in-service experiences can greatly extend the total curriculum capability among vocational-technical educators. Teachers can be asked to teach other teachers; prospective leaders may be given opportunities to work a day or week with a team studying occupational opportunities, evaluating curricular materials, or planning new facilities. Experiences which help move people into curriculum leadership roles do not occur without administrative structures for identifying and encouraging potential leaders, for providing guidance, and/or financing costs. Even more important are imagination on the part of current leaders and faith in the potential of the novice.

Experience in preparing curriculum material alone is not sufficient for training curriculum leaders. Practice needs to be coordinated with guidance and additional study; internships are most meaningful when planned as an integral part of advanced study. The levels of curriculum competency needed by those making major decisions in vocational-technical education will be best achieved in advanced studies or graduate programs. Intensive study of the psychological and philosophical bases or curriculum theories and rigorous preparation for curriculum research must be part of the training program for curriculum developers and leaders.

## Chapter VIII

## NATIONAL IMPLICATIONS

### *RECOMMENDATIONS*

- ***Immediate priority should be given to the establishment and implementation of a nationwide plan for training curriculum specialists.***
- ***All vocational-technical curriculum materials now in existence must be collected, classified, and evaluated.***
- ***National standards for the development of curriculum materials should be established to provide uniformity of procedure, style, and format.***
- ***Plans should be implemented for the dissemination of information on available curriculum materials to all teachers.***
- ***Procedures should be developed for making available to teachers curriculum materials that cannot be obtained through normal channels.***
- ***Plans must be formulated for establishing and operating regional and State curriculum centers that meet standards for insuring efficiency, effectiveness, and quality of work.***
- ***Priority should be given to the development of plans which may be used by the States in conducting or securing continuous programs of in-service training to prepare vocational-technical teachers in the better use of curriculum materials.***
- ***Plans must be implemented for the coordination of all curriculum activities.***

**The single most important factor determining what will be taught is the curriculum and the materials accompanying it. Results obtained from utilization of curriculum materials will vary in accordance with the teacher's ability to use them effectively. The immediate need for rapid expansion of the total program of vocational-technical education cannot be met until an adequate program of curriculum development is in continuous operation.**

**The number of professionally competent curriculum specialists is very limited; and, until many more such persons become available, the total program of curriculum development will be prevented from expanding so as to better meet the needs of vocational-technical education. Training of these specialists is not a matter of a few short conferences but entails a planned program of advancement study in conjunction with some type of internship. Since this takes time, it becomes imperative to initiate a nationwide program of training at the earliest moment. The Office of Education must provide leadership in the development of plans for this project. It is recommended that in the future all contracts for the development of curriculum materials carry provision for internships.**

The amount of curriculum material pertinent to vocational-technical education is very large, but the actual size is unknown at this moment. It is essential that the actual amount be ascertained before initiating a widespread program of development. The task of collecting, classifying, and evaluating this material is certainly a large one and quite possibly will have to be done on a regional basis through contracts with existing curriculum centers or State institutions of higher education. Until there are definite statements concerning the amount of material in existence and the extent to which it can be used, an expanded program of curriculum development cannot be very effective or efficient.

Standards for the development of new curriculum material must be established to provide uniform procedures that will insure quality, proper style, and acceptable format. These standards should also encourage more widespread use of the curriculum material throughout the nation. A program for establishing the necessary standards should be inaugurated immediately. Consultation with curriculum specialists, supervisors, teacher educators, and teachers should be utilized in the development of these standards.

Implementation of plans for disseminating information concerning available curriculum material will help local teachers to meet present needs in vocational-technical education. Plans must provide for this information to reach the local teacher at the earliest possible moment. Information should indicate the specific occupation with which the material is concerned, the level of instruction for which it is intended, the prerequisites for entering students, the necessary facilities, instructional aids, and an overall evaluation.

Much of the curriculum material now in existence is not available to teachers throughout the nation because of restrictions established by the original producer. It will be necessary for the Office of Education to develop plans for reproducing such material and to arrange for its availability to local teachers everywhere.

Many more curriculum centers will be needed to develop materials for vocational-technical teachers. In some cases a regional center will best serve an area, and in other instances State curriculum centers will be necessary. In a few of the very large cities a local center may be justified. However, in order to conserve available funds, only those centers that can meet certain standards for insuring quality of work, proper supportive staff, and adequate professional personnel should be established. Uniform performance criteria for curriculum centers must be developed to insure the best use of monies.

A National goal should be set to provide present teachers with better instruction in the use of curriculum materials, especially in the multi-media approach, so as to meet the needs of diverse groups of youth. The Office of Education should encourage States to develop continuous programs of in-service teacher education to meet this goal.

Any program as comprehensive as the development of curriculum materials must be closely coordinated so as to prevent the duplication of effort and to insure efficiency. Coordination must be on the National level, but the States must cooperate if the program is to be successful. This objective requires the cooperation of *all* groups and individuals involved in developing curriculum materials.

The task of vocational-technical curriculum improvement remains large, but its dimensions are not so much in size as in quality and direction. To meet its responsibilities, vocational-technical education will need to do more than just serve additional people. Those involved in curriculum structure and modification will have to re-evaluate their purpose and realize that time-honored goals must be relevant in today's world and in the world of tomorrow if these goals are to be achieved. Not just more, but different and better, vocational-technical education will be required for the achievement of these goals. New resources are available for accomplishing this task, and they must be used wisely. The task demands reforms and sharp departures from the past, not so much in goals as in the means for attaining them.

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## APPENDIX A

### GOVERNMENTAL AGENCIES WITH POTENTIAL RESOURCES FOR VOCATIONAL AND TECHNICAL EDUCATION

Major Departments:

- Department of Agriculture
- Department of Commerce
- Department of Defense
  - Air Force
  - Army
  - Navy
- Department of Health, Education and Welfare
  - Office of Education
  - Office of Rehabilitation Service
  - Public Health Service
  - National Institute of Health
  - National Institute of Mental Health
- Department of Housing and Urban Development
- Department of Interior
  - Bureau of Indian Affairs—DVE
  - Water Pollution
- Department of Justice
  - Federal Bureau of Investigation
  - Police Training Bureau
  - Bureau of Prisons
- Department of Labor
  - Manpower Administration
  - Bureau of Employment Security
  - Bureau of Apprentice Training
- Post Office Department
  - Postal Services Institutes
- Department of State
  - Agency for International Development
- Department of Transportation
- Treasury Department
  - Bureau of Internal Revenue

Independent Government Agencies:

- Executive Branch Offices
  - Atomic Energy Commission
  - Civil Service Commission
  - Federal Aviation Agency
  - National Aeronautics and Space Agency
  - Office of Economic Opportunity
  - Small Business Administration
- Government Printing Office—Bibliography of Publications

## APPENDIX B

### SUGGESTED STEPS IN CURRICULUM DEVELOPMENT, MODIFICATION, AND IMPROVEMENT

I. PRELIMINARY OPERATIONS
- A. Identify needs for trained people.
  1. Requests from a business or trade association.
  2. Data from Employment Security Office.
  3. Data from community surveys.
  4. Data from local directories.
  5. Information from State Vocational Department.
- B. Identify student needs.
  1. Determine student population to be served.
  2. Determine student interest in proposed program.
  3. Determine concomitant student educational requirements in relation to program being planned.
- C. Identify feasibility for operating program.
  1. Determine fiscal requirements.
  2. Determine adequacy of instructional facilities and equipment.
  3. Determine adequacy and availability of appropriate staff.
  4. Determine health and safety standards of operation.
  5. Determine availability of supporting facilities needed to insure effective training.

II. PROGRAM PLANNING
- A. Develop advisory and consultative groups.
  1. Identify appropriate knowledgeable individuals who can provide occupational advisory service to the school.
  2. Select an advisory group and identify with them their duties and responsibilities.
  3. Utilize advisory group in developing program content, evaluation techniques, student requirements, and assisting in public relations.
- B. Create instructional staff.
  1. Identify individuals who have qualifications to teach the instructional content.
  2. Select teachers with advanced experience and interest in becoming teachers.
  3. Select para-professional staff members when required by instructional program.
  4. Select para-educational staff members from other disciplines to assist in the development of course content.
- C. Develop student selection program.
  1. Establish student goals.
  2. Develop counseling program.
  3. Provide for follow-through and follow-up.

D. Obtain required facilities.
   1. Determine appropriate equipment, supplies, and materials required by instructional program.
   2. Establish a plan for the purchase of necessary equipment and materials.
   3. Establish an equipment maintenance and replacement program.
   4. Develop an instructional flow and environmental control plan for the location of equipment that will promote effective learning.

E. Develop evaluation system.
   1. Determine appropriate evaluation techniques that will provide continual reference to the degree of effectiveness of the instructional program.
   2. Establish a system of check points to provide proper feedback between the instructional program and those assisting in evaluation of it.
   3. Develop possible alternatives to meet changing conditions and to provide for motivation of special groups of students.

III. CURRICULUM MATERIALS DEVELOPMENT

A. Develop instructional content.
   1. Use an occupational analysis to determine the skills, knowledge, work habits, and attitudes required by the occupation.
   2. Check results of analysis with the advisory group for suggestions as to degree of attainment, student performance goals, and the division of time.
   3. Sequence instructional flow into course outline.
   4. Review performance goals with interdisciplinary teachers.
   5. Develop course of instruction containing instructional materials, evaluation units and delineating required equipment, audio-visual aids, and the use of other media in providing for the needs of diverse groups.

IV. CURRICULUM OPERATION

A. Utilize course of instruction.
   1. Have student utilize all possible media in individual instruction, small group discussions, and presentations to whole class.
   2. Maintain a continuous evaluation of each student's progress in terms of the stated student performance goals.
   3. Provide for the discussion of evaluations with the advisory group at stated intervals and determine modifications that should be made in student goals.
   4. Establish proper contacts with employers after job placement so as to better determine strengths and weaknesses of program and to feed back this information for program evaluation.

V. CURRICULUM MODIFICATION

A. Maintain curriculum currency.
   1. Establish and maintain a system for continuous input concerned with changing occupational needs.
   2. Integrate occupational need requirements with changing student needs and evaluative results from the instructional program into a designated plan of action that permits modification of the curriculum, instructional material, and media.
   3. Develop or obtain programs of in-service activities designed to enhance the professional abilities of the staff members.
   4. Re-do the cycle using applicable steps beginning with III.